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Efficacy of Elastic Resistance Training Program for the Institutionalized Elderly

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Objective: This study aimed to assess the efficacy of a progressive resistance training program on dynamic balance and functional mobility among the institutionalized elderly.
Methods: A total of 45 institutionalized elderly from a senior welfare home participated in this quasi-experimental study. The exercise group (n = 21) attended a group-based program for 12 weeks, meeting twice a week. A 2-factor repeated-measures analysis of variance and independent and paired *t* tests were used to analyze the data.
Results: The results showed a significant improvement for the exercise group in the Reach Test for the forward (%Δ = 18.51%), right (%Δ = 20.0%), and left (%Δ = 17.7%) directions and in the 6-Minute Walk Test (%Δ = 12.09%, all *P*s .001) after the intervention.
Conclusion: The elastic band training provides a simple and inexpensive exercise program that improves the balance control and consequently functional mobility effectively.
Key words: aging, balance, elastic resistance training, functional mobility

Aging is associated with physical, psychological, and social changes that may lead to a significant level of dependency.[1] Among these, sarcopenia or progressive muscle strength or mass loss has been well documented.[2] It is a major factor for age-related weakness and frailty.[3] Muscle strength reduces by 1.5% per year after the age of 50 years and is accelerated at the age of 60 years and above,[4] as people in their 80s have 40% less muscle strength than in their 20s.[5]

Lower-extremity strength is the major factor for maintaining mobility and physical abilities. Strong lower-extremity muscles and flexible joints play key roles in balance performance.[6] Leg muscle weakness was documented to be an important predictor of balance impairment in older adults.[7] Balance ability is related to not only accurate sensory and neurological systems but also good muscle strength.[8]

Sufficient balance control is essential for independent and safe performance of activities of daily living such as walking, stair climbing, or bending forward.[9] According to Jonsson,[10] age-related balance deterioration has a negative impact on the ability to safely carry out activities of daily living. PrataI and Scheicher[11] also documented the association between balance and daily activities, indicating that elderly people who had better balance have a good level of independence. Muscle strength loss and balance impairment are 2 major risk factors for falls.[12] Moreland et al[13] in their meta-analysis study reported that older people with lower-extremity muscle weakness had 1.76 more risk for falls and 3.06 more risk for repeated falls.

Health care providers need to promote the exercise interventions that help increase the functional capacity and improvement of quality of life of institutionalized older adults.[14] Resistance or strength training has been shown to be the main intervention for preserving functional independence among older persons.[15] This training, combined with balance training, plays an important role in the reduction of falls in the elderly persons.[16,17] There is a little evidence that strength or resistance training by itself can improve the balance and reduce risk of falls.[18-20] Furthermore, the majority of previous studies have used gym-based training using fitness machines.[21] These programs are not economical or easily accessible for many older people. Many of the older people have difficulties traveling regularly to sport centers and maintaining their exercise program.

Elastic resistance devices (bands or tubes) are simple and practical equipment for strength training.[22] Elastic band is suitable for the elderly persons because of its low cost, simplicity, lightweight, portability, and flexibility despite its ability to provide strong resistance.[23] So, it is a good alternative instrument for resistance training among the elderly persons, including those residing in the institutions. However, there is a scarcity of research examining the feasibility and effectiveness of elastic resistance training (ERT), especially on balance performance and functional mobility in elderly subjects.[24] As such, the aim of the present study was to assess the efficacy of a simple exercise program in the institutionalized elderly.

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